Chapter 7
MANAGEMENT ISSUES and OPPORTUNITIES

ENVIRONMENTAL ISSUES AND OPPORTUNITIES

Various environmental issues affect Sarangani Bay. The foremost is the siltation of rivers, which discharge to Sarangani Bay. This has led to the sedimentation of coral reefs and seagrasses. This has also led to high concentrations of total suspended solids (TSSs) in shore areas near the river mouths. Downstream concentrations range from 253 to 301 mg/L. Studies show that when TSS concentration is increased to 80 mg/L, the macroinvertebrate population will decrease by 60 percent. TSS in coastal waters exerts many harmful effects on the marine environment. When in suspension, it reduces the penetration of sunlight, becomes carriers of toxic substances and pathogenic organisms over great distances, and affects fish and filtering species sensitive to the blocking of branchiae. When it settles, it clogs spawning grounds inhibiting the reproduction of fish and it forms sludge blankets causing asphyxiation to the benthic environment.

This is particularly prevalent in the coastal area around Buayan River where one can see the discharge plume from the river as it joins Sarangani Bay. Fishers in the area attribute this to upland activities. They say that the sediments come from manure from the livestock industry and erosion caused by deforestation and destructive farming practices. Analyses of suspended solids in the sampling station nearest to Buayan River yielded alarming results (163 mg/L) compared to the 14 other stations (concentration ranges from 27 to 56 mg/L).

LGUs have yet to find a long-term solution to the sedimentation entering Sarangani Bay. The CRM director under the Office of the Provincial Agriculturist of Sarangani Province identified this as one of the major problems facing the coastal areas of Sarangani Bay. The major stumbling block to effectively stopping sedimentation is the lack of jurisdiction of the affected communities. The sediments probably come from upland areas where logging, destructive farming methods, and mining are prevalent. In some cases, these take place outside Sarangani Province in neighboring South Cotabato.

There is no easy solution in resolving the issue of sedimentation. There should be strong coordination and communication between the provinces of South Cotabato and Sarangani on the effects of sedimentation on the coastal ecosystems. The information, education, and communication (IEC) campaign should be focused on the coastal areas and the upland areas. Aside from Sarangani Province and GSC, the IEC campaign should also address South Cotabato Province. The government (both local and national) should address all the causes of siltation simultaneously. These are mining, logging, and discharges of the livestock industry.

It is difficult to estimate the contribution of the mining industry to the sedimentation in Sarangani Bay. At this time, it is probably smaller than logging or mining.

Industrial pollution is mainly a local issue in GSC, since the outlying municipalities generate little industrial pollution. Pollution seems to be concentrated in Tambler, where the fish canneries are located. The DENR is allegedly having difficulty in stopping their operations because its regional office is in Davao. Most of these fish canneries do not have adequate wastewater treatment facilities (WTFs). The fish canneries complain of the high costs in constructing and maintaining WTFs. In one instance, the government closed a tuna processing firm by issuing a cease-and-desist order (CDO); however, the firm continued operation in the middle of the night. Eventually, the firm was allowed to operate while a WTF was being constructed.

Domestic pollution is another issue that needs to be addressed. As shown in Chapter 2, laboratory analyses of samples taken in Sarangani Bay indicate high levels of total coliform. The assumption is that the major causes of this are the households without any toilets. As population increases, the total contribution of domestic waste to the pollution going into Sarangani Bay will increase exponentially. LGUs should improve current sewerage systems in their respective city and municipality. Coliform bacteria associated with domestic waste are by themselves not pathogenic, but they can cause urinary bladder infections. The presence of coliform implies that there could be a health risk because pathogens could infect a person via food ingestion. Skin disease and intestinal disorder can result from swimming in coliform infested waters.

Another source of coliform bacteria is livestock waste. Livestock waste in rivers entering Sarangani Bay has been associated with siltation. Small-scale livestock farms have no wastewater treatment systems (WTSs). It is difficult to force these small farms to construct any viable WTS because the costs in constructing and maintaining these systems are prohibitive from the point of view of these farmers. Studies should be conducted to provide these small-scale farmers with an option of treating waste before its discharge to the various rivers. One possible option is a centralized WTS, but this option needs further study. In the meantime, pollution prevention measures could be implemented to reduce wastewater discharge.

Overfishing, illegal fishing, encroachment of commercial fishers in municipal waters, and use of destructive fishing methods are all major issues. Fisheries technicians are particularly concerned with the economic effects of these problems on the municipal fishers living in their areas of jurisdiction.

Dynamite fishing used to be prevalent in the area, but it is not as extensive as it used to be although it still occurs. Various other illegal fishing methods are used such as the use of fine mesh nets, superlights, and *muro-ami*. Some of these fishing methods result in coral reef destruction and all result in overfishing. The PCRA identifies these as the most pressing problems facing the area.

MGP recommends that the following measures be taken to reduce overfishing in the area:

- Certain times of the year should be closed season for certain species to allow for spawning;
- Mesh sizes should be increased to allow immature individuals to escape; and
- Presidential Decree 704 should be strictly enforced to ease the pressure on big-eye scad (*Selar crumenophthalmus*) population.

Although mangrove destruction is not a major issue in the area, it is a long-term concern of environmental managers. Mangroves are an ecological habitat for various organisms including commercially valuable species. Mangroves, like their upland counterparts, prevent erosion.

To address mangrove destruction and as part of the reforestation efforts of the DENR and Sarangani, the Mangrove and Marine Resources Research and Development Training Center was established in Glan. However, other mechanisms need to be put in place in order to curb mangrove destruction. As mentioned earlier, Silliman University reports only 25 ha of mangrove areas left in Sarangani Bay. Questionnaire updates provided by CRMP report that the total mangrove area is around 200 ha. Assuming that the figure reported in 1993 of 508 ha of mangroves was an overestimate, it is still

higher than the 25 ha of mangrove reported by Silliman. Whatever the case, it is clear that mangrove denudation is occurring and needs to be immediately addressed.

LGUs should implement a moratorium on fishpond construction. In implementing this strategy, LGUs should have a strong political will, as some fishpond owners have strong political influence or are political figures themselves. The DENR should strictly enforce and monitor mangrove cutting for firewood. Reforestation also seems to be a problem, because of high mortality of replanted seedlings. The DENR needs to study the cause of the high mortality rate of the seedlings to determine what is needed to ensure the success of rehabilitation projects.

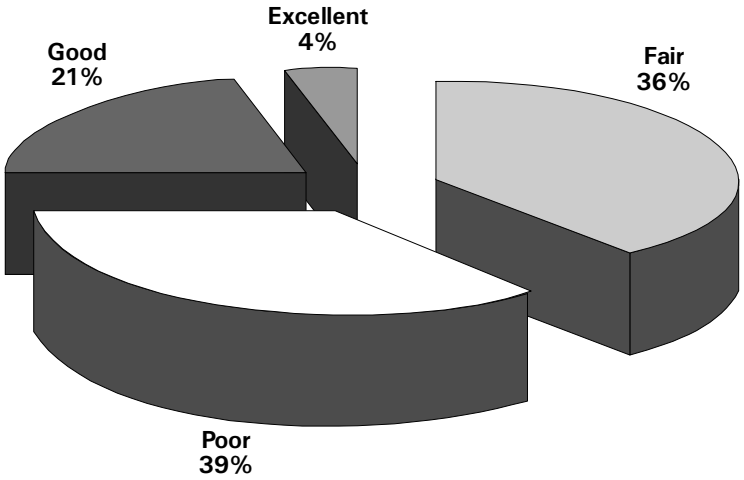

Figure 7.1. Status of coral reef ecosystem in Sarangani Bay.
Data from the Earth Island Institute, 1997

Destruction of coral reefs is also a concern. Fishers are now realizing that coral reefs protect the shore and maintain marine biodiversity. Coral reefs also ensure sufficient increase in fish catch. Artificial reefs and fish attracting devices have enhanced previously damaged reefs. The Earth Island Institute reports that only 4 percent of the coral reefs are in good condition while 39 percent are in poor condition (Figure 7.1). The main causes of degraded reefs are extensive dynamite fishing and sedimentation. There are also reports of coral extraction. However, this is not as extensive, and is limited only to some beach resorts.

ECONOMIC ISSUES AND OPPORTUNITIES

The issue of sedimentation also has its roots in the economic condition of the people living in upland areas. Logging has been an established industry in the whole of Mindanao ever since the timber boom in the early 1960s. So many people depend on the logging industry, and even with the selective logging ban, some people still cut logs because of the lucrative market. Most of the people who log do not know of any other livelihood. Government should address this issue by providing other sources of income.

The conditions are the same for people who use destructive farming methods such as the *kaingin* (slash-and-burn) system. These people live a hand-to-mouth existence. In order to make ends meet, they maximize production to the point of

causing environmental degradation. Slash-and-burn farming involves burning large tracts of forestland for farmers to have a cleared fertile land for planting. Once the produce is harvested, the farmer leaves the place to look for another area to burn. This leaves the previous area denuded and unable to maintain soil stability, leading to erosion and sedimentation in the rivers and ultimately in Sarangani Bay.

According to provincial officials, *kaingin* is almost non-existent and illegal logging is not as rampant as before. However, the damage has been done. The effects of previous logging activities are being felt to this day.

Mangrove destruction does not seem to be a major economic issue among coastal dwellers. This is probably the reason why it is not a major concern in Sarangani Bay. Nevertheless, the people should be made aware of the significance of mangroves in the long term. The loss of mangroves translates into loss of commercially viable fishes, and therefore, income. Around 800 ha of coastal area is used for aquaculture ponds in Sarangani. It is difficult to gauge exactly how much of this area was previously mangrove forests, but it is likely that most was mangrove forest.

The provincial government is implementing an IEC campaign on mangrove protection. It also provides limited financial and technical support for management and reforestation.

Figure 7.2. Project evaluators discussing the problem of limited entry with residents of Sapu-Padidu, Glan.

Socioeconomic issues identified in the PCRA include lack of fishing gear and very few fish. Fishing grounds are getting farther and farther from the shore, as the fishing grounds near the shore become more overfished. Overfishing often results from the difficult living conditions of marginal fishers and their competition with commercial fishers (who are also overfishing). These fishers need to be educated on the long-term effects of overfishing and need to be taught sustainable fishing methods. New entry to fishing must be discouraged (Figure 7.2).

Fish canneries in Tambler employ many workers, provide income to the city government, and are symbols of the economic growth being experienced by GSC. However, a balance between economic growth and protecting the environment needs to be maintained.

Almost all the roots of environmental and coastal degradation lie in economics. Some destroy because of actual need, others because of greed. Most do it unknowingly, while some know what they are doing but are left with no choice. Almost all can stop actual environmental degradation and pursue sustainable development if educated, and additional sources of income that are not so resource-dependent are provided.

POLITICAL AND INSTITUTIONAL ISSUES AND OPPORTUNITIES

Local government should prepare profiles for priority projects (protected areas, fisheries, and pollution), identify proponents, budget estimates, and potential funding agencies. Priority projects should include rehabilitation of mangrove forests, rehabilitation of coral reefs and reef fish production, environmental education, establishment of community-based enterprises, and zonation. Fisheries programs should include fish stock assessment, development of cooperatives, squid drying for women entrepreneurs, deep-water hand reel fishing, alternative *banca* material, cage culture of siganids and groupers, aquaculture capability building, *bangus* fry banking, and seaweed production. Environmental quality management programs should include a sanitary landfill, water supply to outlying *barangays*, domestic sewage treatment systems, institutional monitoring capability, and selection of pilot industry for development of waste disposal systems.

It is fortunate that the current provincial government of Sarangani follows a policy that objects to all applications for exploration permits filed with the Mines and Geosciences Bureau. However, other provinces in the area need to follow the example of Sarangani. The national government must also support these initiatives of LGUs, as they try to balance ecological preservation and economic development.

To avert further destruction by illegal logging and to reforest previously logged areas, the DENR, in cooperation with the Provincial Government of Sarangani are implementing various projects. These include CBFM in Kiamba and Maitum and reforestation under the Forestry Approach Reforestation and Community Approach Reforestation Schemes.

There are already existing laws regulating most of the environmental issues. However, due to the lack of resource of both national government agencies and LGUs, the enforcement of these regulations is spotty at best. Both the PCG and the Philippine National Police (PNP) Maritime Command have limited manpower and resources, particularly patrol boats and gasoline. They also have more pressing issues to contend with, particularly seajacking, contraband smuggling, and drug smuggling. These laws are not only environment- or coastal resource-related, but also include other major crimes and violations. Although most municipalities have deputized *bantay dagat* or fish wardens, their effectiveness is hampered by their lack of knowledge of the law and procedures of arrest. The fish wardens or *bantay dagat* also lack incentives. The

government hardly pays them, and usually they do not have the necessary equipment such as radios and fast boats to go after the illegal fishers who are oftentimes better equipped and armed.

Additionally, politicians, police, local officials, and fishers do not fully understand the laws and procedures or, when convenient, pretend not to understand. Furthermore, the agriculture officers devolved to the LGUs are trained in upland agricultural practices. Very few of them have fishery backgrounds and the rest do not have training in fishery management. In most cases, the government acts only when it receives a complaint with enough influence. Even when the government has patrol boats, these are usually too slow to catch illegal fishers. Some municipalities were given patrol boats; however, after a few years, these became inoperable due to lack of maintenance and repair. Some powerful or influential people are also at the heart of water pollution and commercial fishing in municipal waters.

Recently, the Sarangani Province bought a patrol boat to be used in patrolling municipal waters.

Seajacking is also a major issue identified in the PCRA (Figure 7.3). Although the various cooperatives and associations have been effective in combatting pirates, small fishers are still falling prey to this thievery sometimes not only losing their catch but also their lives.

Figure 7.3. Technical working group drawing the PCRA maps that identified issues such as seajacking.

It would seem that the *bantay dagat* could best only serve as a watchdog alerting the authorities such as the PNP and PCG who should make the actual arrest of illegal fishers. A study is needed to show how an effective network of *bantay dagat* could be established to support local law enforcement agencies responsible for coastal law enforcement.

Fishing effort should be reduced within the bay waters. Laws should be enforced which prohibit commercial fishers from fishing within municipal waters. Alternative sources of livelihood should be found for subsistence fishers, such as *sari-sari* stores and pig fattening.

Encroachment of commercial fishers in municipal waters seems to be the most common complaint of fisherfolk in the municipalities of Sarangani. This is a result of a perceived open-access system. In recent years, several boats whose ownership is outside of the GSC and Sarangani Province have begun to fish in the bay. Local residents claim that these non-resident fishers use illegal methods that are efficient in catching fish such as fine mesh nets.

PCRA results show that the fishers still trust that the government will help them in their plight, particularly in regard to illegal fishing. They believe that the government will be able to enforce the laws and arrest and imprison illegal fishers. In a case study by Olive (1993) in Sarangani, municipal fishers reported commercial fishers in municipal waters. The mayor got the local police to arrest the 30 fishers and to confiscate their boat. However, after a few days, the mayor was forced to release them because the local government could no longer afford to feed them.

Figure 7.4. More marine sanctuaries are being established in the bay area.

Management zones should be classified as sanctuary or preservation zones, buffer zones, sustainable use zones, rehabilitation zones, and recreational zones (Figure 7.4). Areas south of Pampang Point should be classified as a preservation zone.

Fishers also believe that establishing fish sanctuaries is a solution to overfishing by providing fish with a breeding ground in municipal waters.

The framework for the coastal area management plan for Sarangani and GSC recommends the establishment of Municipal CRM Boards. These bodies can: (1) provide the necessary direction of various CRM programs and projects; (2) provide a venue for the integration and coordination of various CRM efforts; (3) provide a venue for stronger community participation in CRM planning and decision-making process; and (4) raise local community environmental concerns.

Most of the people seem to be concerned more with the economic impacts of the issues, rather than their environmental effects. These people see environmental degradation as affecting their source of income, and are more worried about its effect on the money that they earn rather than on actual protection of the environment.

SUMMARY

The Sarangani baywide management plan, to be endorsed in 2001, reflects many of the issues and solutions discussed in this chapter. The planned activities follow:

Summary of Management Programs and Activities for Sarangani Bay

Habitat Enhancement

- Profiling and assessment of natural habitats including major rivers
- Mangrove rehabilitation and replanting
- Establishment of new and/or enhancement of existing marine protected areas in the bay
- Rehabilitation of major rivers
- Implementation of adopt-a-shoreline and adopt-a-river projects
- Resource use inventory and zoning
- Monitoring and evaluation

Fisheries

- Baseline information gathering
- Periodic fish stock assessment
- Conduct of feasibility study on open-closed seasons and other possible fisheries management tools
- Implementation of fisheries management tool(s) best suited in Sarangani Bay
- Feasibility study on assigning property or access rights to community organizations
- Monitoring and evaluation

Pollution and Water Quality

- Baseline information gathering
- Establishment of water quality laboratory and monitoring system
- Economic analyses and valuation of environmental costs
- Conduct of environmental policy research studies and application of market-based instruments for pollution control
- Construction of appropriate pollution control devices
- Conduct of IEC activities that also include concerns on policies and standards
- Monitoring and evaluation

Shoreline Waterfront Development

- Baseline information gathering
- Establishment of necessary buffer zones and setting up of corresponding demarcations
- Development of sea-use plan
- Monitoring and evaluation

Community Development

- Baseline information gathering
- Community organizing and strengthening of existing POs
- Conduct of leadership enhancement and planning and management skills training
- Conduct of training courses on ICM and related matters
- Conduct of social mobilization activities
- Monitoring and evaluation

Population and Settlements in Coastal Areas

- Baseline information gathering
- Formulation of policies and settlement plans for coastal municipalities and *barangays*
- Construction of sanitary toilets for coastal communities
- Development of a coastal solid waste management program
- Development of a potable water program
- Development of a coastal resettlement program
- Monitoring and evaluation

Tourism and Enterprise Development

- Baseline information gathering
- Conduct of feasibility and viability studies
- Identification and implementation of appropriate tourism and other enterprise activities
- Skills development and training
- Development of linkages and/or partnerships with appropriate groups
- Monitoring and evaluation

Information, Education, and Communication

- Baseline information gathering
- Establishment of an Environmental Conservation and Protection Center
- Preparation of IEC and advocacy materials
- Networking of local academic and research institutions to help implement appropriate plan activities
- Establishment of the Sarangani Bay management information system/ geographic information system
- Training support to different projects and activities
- Monitoring and evaluation

Strengthening the Legal and Institutional Component

- Baseline information gathering
- Review of pertinent laws and regulation (environmental/coastal)

- Conduct of general IEC activities on law enforcement and coordination with law enforcement agencies as well as for communities
- Conduct of regular/programmed meetings of the different law enforcement agencies and meetings with the community
- Conduct of research on the optimum level of law enforcement personnel and their logistic requirements
- Conduct of project activities that would increase the number of law enforcement personnel (or deputized wardens)
- Acquisition and maintenance of logistics facilities including petrol and speed boats
- Monitoring and evaluation